



A Clinical Study of Surgical Management of Various types of Intra Abdominal Injuries due to Blunt Trauma Abdomen and their Outcome

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Abstract

Blunt trauma is physical trauma to a body part with an object that doesn't pierce the skin and enter body tissues. Blunt trauma often occurs in road traffic collisions, assaults, falls, domestic violence, and sports injuries. Blunt trauma can result in abrasions, contusions, lacerations, internal haemorrhages, bone fractures, as well as death. The abdomen is most commonly involved, and blunt abdominal trauma constitutes 75% of all blunt trauma. Because of the vital nature of the organs housed in the abdomen, early evaluation and management are a priority in blunt trauma abdomen. Blunt trauma to the abdomen poses a great challenge to the surgeon as he has to decide his priorities in dealing with associated injuries to other areas of the body. The ATLS guidelines provide a systematic approach to the management of trauma patients, emphasising the concept of the "golden hour" and that timely, prioritised interventions are necessary to prevent death and mortality.

Keywords: Blunt Trauma Abdomen, Splenic Laceration, Liver Laceration, Splenectomy, E Fast, Diagnostic Peritoneal Lavage.

Introduction

The word trauma originates from the Greek word 'Traumatikos', meaning wound. It is defined as cellular disruption caused by environmental energy that is beyond the body's resilience.¹ Major trauma is one that has the potential to cause prolonged morbidity or death. Worldwide, trauma is a significant cause of death and disability in the population under 35 years of age, mostly due to blunt trauma.

Regardless of age, it is the third most common cause of death.¹ Blunt trauma is physical trauma to a body part with an object that doesn't pierce the skin and enter body tissues.² Blunt trauma often occurs in road traffic collisions, assaults, falls, domestic violence, and sports injuries. Blunt

trauma can result in abrasions, contusions, lacerations, internal haemorrhages, bone fractures, as well as death. The abdomen is most commonly involved, and blunt abdominal trauma constitutes 75% of all blunt trauma.³ Motor vehicle accidents account for 75 to 80% of blunt abdominal trauma.³ Other causes of blunt abdominal trauma include falls from heights, assaults, sports injuries, industrial mishaps, bomb blasts, falls from bicycles, etc.

Because of the vital nature of the organs housed in the abdomen, early evaluation and management are a priority in blunt trauma abdomen. Unrecognized abdominal injuries continue to be the cause of preventable deaths after truncal trauma⁴. As blood is not an irritant, even with

significant intraabdominal haemorrhage, there may not be obvious signs of peritonitis⁵. Abdominal distension is subjective and a fall in blood pressure may be a very late sign, especially in a young fit patient⁵. In addition, impaired sensorium secondary to head injury or alcohol intoxication, spinal cord injuries, fractures of the lower rib cage and pelvis hinder proper physical examination of the abdomen.⁴ Hence, surgeons should have a high index of clinical suspicion for the possibility of intra-abdominal injury in patients with torso trauma and unconscious patients with head injury until proven otherwise.⁶ Blunt trauma to the abdomen poses a great challenge to the surgeon as he has to decide his priorities in dealing with associated injuries to other areas of the body. For this reason, The American College of Surgeons Committee on Trauma developed the ATLS (Advanced Trauma Life Support) course in the 1970s on the premise that appropriate and timely care can improve the patient's outcome. The ATLS guidelines provide a systematic approach to the management of trauma patients, emphasising the concept of the "golden hour" and that timely, prioritised interventions are necessary to prevent death and mortality.⁷ In spite of the best techniques and advances in diagnostic and supportive care in trauma, the morbidity and mortality rate continue to be high. The reason for this could be the interval between trauma and

hospitalisation, inadequate and lack of appropriate surgical treatment, delay in diagnosis, post-operative complications, and associated trauma, especially to the head and thorax. In view of the increasing number of motor vehicles and, consequently, road traffic accidents, this dissertation has been chosen to study the cases of blunt abdominal trauma and their surgical management with reference to the patients presenting at Government General Hospital, Guntur.

Materials & Methods

All patients admitted with blunt trauma to the abdomen in surgical wards at Govt. General Hospital, Guntur from June 2020 to July 2022.

Aim & Objectives

- 1) To study age and sex wise distribution of blunt abdominal trauma.
- 2) To study the incidence of solid organ injuries, hollow viscus injuries and other injuries in blunt trauma abdomen and underlying mode of injury.
- 3) To study the role of conservative management and surgical management in various types of intra-abdominal injuries.
- 4) To study morbidity and mortality of various types of abdominal injuries in blunt trauma abdomen.

Results

Age Distribution

Age group	No of patients	Percentage
14-20	6	10%
21-30	16	27%
31-40	19	32%
41-50	15	25%
51-60	2	3%
61-70	2	3%
Total	60	100%

Sex Distribution

Sex	Count of Sex	Percentage
Male	54	90%
Female	6	10%
Grand Total	60	100%

Mode of Injury

Table 20: Frequency of different modes of injury in the study.

Mode of injury	Count of Mode of injury	Percentage
RTA	42	70%
Assault	7	11%
FFH	6	10%
Fall of heavy object on abdomen	2	3%
Hit by animal	1	2%
Accidental trauma with blunt object	1	2%
ROV on abdomen	1	2%
Grand Total	60	100%

Clinical Features

Clinical features	No of cases	Percentage
Abdominal pain	55	92%
Distension	20	33%
Guarding	9	15%
Rigidity	3	5%

Associated Injuries

Type of injury	No of patients	Percentage
No associated injuries	31	52%
Head injury	4	7%
Chest injury	12	20%
Extremities #	12	20%
Pelvic #	2	3%
Spine #	3	5%

eFAST

All the 60 patients were subjected to eFAST. Out of 42 patients with solid organ injuries, eFAST was able to detect solid organ injuries in 31.

CECT Abdomen and Pelvis

Organ injured	No of patients	Percentage
Liver	16	27
Spleen	13	22
Bowel	9	15
RPH	8	13
Kidney	1	2

Type of Management

Type of treatment after initial assessment	No of patients
NOM	37
OM	23
Total	60

Outcome of NOM

Conservative	23
AE attempted	14
AE failed and operated	5

Operative Procedures

Type of surgery	No of patients
Splenectomy	9
Liver surgifoam packing	5
Small bowel perforation closure	5
Small bowel resection and anastomosis	3
Double barrel ileal stoma	1
Hartmann's procedure	1
Triple tube ostomy	1
Splenorrhaphy	1
Mesenteric tear repair	2

Organ Specific Injuries

Organ injured	Frequency	Percentage
Spleen	22	37
Liver	19	32
Bowel	12	20
RPH	11	18
Mesenteric tear	2	3
Bladder	2	3
Kidney	1	2

Outcome

Mortality rate in this study is 8.4%.

Outcome	Frequency	Percentage
Complete recovery	55	91.6
Total deaths	5	8.4

Discussion

Most of the patients in the study were males and belonged to the age group of 21- 40 years, which also happens to be the working age group. About 59% of the patients in the study were in the age

group of 21-40 years. As age increases above 40 years, there is a decline in incidence, probably due to decreased use of motor vehicles, and fewer chances of getting into fights at old age. Only 6% of patients were found to be over 50 years of age.

90% of the study population was of male sex, and the male to female sex ratio was 9:1. This is most likely due to the fact that males are more likely than females to be involved in physical violence, and driving under the influence of alcohol is more common in men.

Most patients (88%) in the study presented within 24 hours of onset of injury.

5% of patients presented within 48 hours and 7% of patients presented 48 hours after the accident. The reasons for the delay in their presentation are the lack of a trauma center nearby, and the distance between our center and the site of accident being large, and the ignorance of patients. As the latent period increases, the physiological state of the patient worsens, which increases the mortality.

In the current study, 92% of the patients had abdominal pain, and 33% had abdominal distension. Abdominal guarding was noted in 15% and rigidity in 5% of the patients.

In this study, five patients had no specific abdominal signs or symptoms. Two of these patients had retroperitoneal hematoma and were managed conservatively.

One patient had diffuse axonal injury, so signs and symptoms could not be elicited.

Two patients were under influence of alcohol and found to have hemoperitoneum. Abdominal signs are unreliable in patients with spine injury, altered sensorium due to head injury, or alcohol intoxication. Also, patients with retroperitoneal hematomas and injuries to retroperitoneal organs won't manifest signs and symptoms immediately. Thus, relying on abdominal signs can predispose one to miss an intrabdominal injury, which is the leading cause of death due to hemorrhage.

Shock was seen in 12 patients (20%). It was predominantly associated with solid organ injury and hemoperitoneum, which accounted for 83% of the patients with shock.

All the patients in the study were subjected to eFAST scan and its sensitivity to detect solid organ injuries and free fluid was only 71%. CECT with oral and IV contrast was done in all the

hemodynamically stable 48 patients. In this study CECT missed out a case of jejunal perforation and another case with gastric serosal tears thus it has sensitivity of 77% in detection of bowel injuries. CECT was 100% sensitive in detection of solid organ injuries and retroperitoneal injuries.

In this study, solid organs were the most commonly involved, accounting for 49%, which matches with the literature that describes how solid organs injuries are commonest in blunt abdominal trauma. The spleen was the commonest organ injured, followed by the liver in this study.

In this study, all the hemodynamically unstable 23 patients (38%) were operated on immediately. The remaining 37 patients were considered for nonoperative management, of which 14 needed angioembolization in view of ongoing bleeding from solid organs. Angioembolization failed in five patients and they were treated by surgery. Thus, a total of 32 patients (53%) were successfully managed non operatively and 28 patients (47%) were operated on.

Splenectomy was the most common type of surgery performed in our study, in 9 patients, accounting for 32% of the operated cases. It is followed by liver surgifoam Packing.

Conclusions

A Total of 60 cases of blunt trauma to the abdomen conducted in Government General Hospital, Guntur affiliated with Guntur Medical College from June 2020 to July 2022. The majority of the patients (59%) belonged to the working age group of 21-40 years. The male to female sex ratio was 9:1. Road traffic accident was the commonest mode of injury in 70% of the patients. 92% of the patients presented with abdominal pain.

Most of the patients (88%) presented to Emergency Room within 24 hours of injury. eFAST and CECT had sensitivities of 71% and 100% respectively in detecting solid organ injuries. Presence of associated extra abdominal injuries, delayed presentation were associated with poor prognosis. Solid organs were

commonest injuries in the study with spleen (37%) being the most common followed by liver (32%). In current study 53% of the patients underwent successful nonoperative management. Solid organs with higher grade injuries were more prone to failure in non-operative management. The mortality rate in this study was 8.4%.

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